OMPHALOCELE, GASTROSCISIS: EPIDEMIOLOGY, SURVIVAL, AND MORTALITY IN IMAM KHOMEINI HOSPITAL, AHVAZ- IRAN

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Gastroschisis and omphalocele are the most common malformation of the anterior abdominal wall. The aim of the study was to determine the abdominal wall defect frequencies, survival, and mortalities in Ahvaz, Khuzestan province of Iran.

Material and methods. All cases born with omphalocele or gastroschisis whom born in Imam Khomeini hospital, were included in this study. Duration of study was 3 years from April 2005. All patients treated at Imam Khomeini hospital in Ahwaz, Iran.

Results. Among 15321 consecutive births, 42 patients had abdominal wall deformity. Overall incidence was 27.41 per 10,000 live births. Of all cases, 18 (42.9%) of cases were male and 24 (57.1%) were female. Of all cases, 21.7% of patients with omphalocele and 10% patients with gastroschisis had other anomalies. Of all cases, 71.8% of patients with omphalocele and 60% with gastroschisis underwent surgery. The type of anomaly (omphalocele and gastroschisis) had correlation with post operation prognosis significantly (p<0.001). Of 66.7% of patients underwent surgery, 46.4% with mesh and 53.6% without mesh performed. 80% of patients with omphalocele and 20% with gastroschisis were lived.

Conclusions: In our study, mortality was significantly higher in cases with gastroschisis than cases with omphalocele.

Key words: omphalocele, gastroschisis, mortality, abdominal wall defect

Gastroschisis occurs in one of 10/000 live births and omphalocele in one of 4/000 to 7/000 live birth (1). The Centers for Disease Control and prevention have estimated the national prevalence for these defects to be 3.73 and 2.09 per 10,000 live birth for gastroschisis and omphalocele, respectively (2). Association with young maternal age (< 20 yr) and environmental factors have been proposed (3, 4). Khuzestan province have many oil and petrochemical complex. Also, 8 year war was occurred in this province. So, Khuzestan may had more possible risk factor than other province in Iran.

The aim of the study was to evaluate epidemiology, outcome, and mortality of cases with abdominal wall defect in our hospital.

MATERIAL AND METHODS

This retrospective study was carried out in Imam Khomeini hospital from 2005, 1st April till 2007, 30th March. During 3 year of study, all of neonates born with abdominal wall defect included in this study. Sex, gestational age, mother’s age, parental consanguinity, type of defect, associated abnormality, and size of defect were recorded. Data was analyzed by SPSS version 13.0 (SPSS Inc, Chicago, IL, USA). Chi-square was used for analysis.

RESULTS

Of 15321 live newborn, 42 cases had abdominal wall defect. Of 42 cases, 32 (76.2%) had
Omphalocele and 10 (23.8%) had gastroschisis. Incidence was 27.41/10,000 live birth. Incidence for omphalocele was 20.88/10,000 live newborn and for gastroschisis was 6.52/10,000 live newborn. Omphalocele was significantly more common than gastroschisis (p<0.0001, Chi-square). Associate anomalies were shown in tab. 1.

Of these cases, 14 (33.3%) were seen in 1st year of study; 16 (38.1%) in the 2nd; and 12 (28.57%) in the 3rd year of study.

Of all cases, 18 (42.9%) were male and 24 (56.1%) were female (p=0.19, Chi-square).

Of these cases; 69% of cases were the 1st newborn, 19% of cases were the 2nd newborn, 4.8% were the 3rd newborn, and 7.2% of cases were the 6th or 7th newborns of their family.

Of all cases, 78.6% were term infants and 21.4% were preterm neonates (p<0.0001, Chi-square). Mean of birth weight was 2971±697 g with range 1470 to 4800 g. Parental consanguinity was detected in 28.2% of cases. Cesarian section was done for 59.5% of cases. One twin pregnancy was seen with one affected twin.

Associated anomalies were seen in 27.1% of omphalocele cases and 10% of gastroschisis cases (p=0.5). Of these cases, 28 cases underwent surgery. Of surgical procedure, mesh was used in 46.4% of cases. Single staged repair was done in 82.1% of cases and two staged repair was used for 17.9% of cases.

Eighty percent of cases with omphalocele survived. Only, twenty percent of cases with gastroschisis survived. There was significant correlation between type of anomaly and outcome (p<0.0001).

Of cases underwent surgery, 65% were discharged with good condition and 35% were expired.

Gestational age had no significant correlation with post operative prognosis (p=0.176). Birth weight had no significant correlation with post operative prognosis (p=0.126). Mother’s age had no significant correlation with type of diagnosed anomaly (p=0.176). There was no significant difference between mother aged ≤25 yr with mother aged > 25 year (p=0.295).

Of all cases, 81% had not prenatal ultrasonography and 19% had prenatal diagnosis. Minimum size of defect was 2 cm and maximum size was 12 cm (5.22±2.6). There was no correlation between size of defect and post surgical prognosis (p=0.31).

### Table 1. Associated abnormalities in patients with omphalocele and gastroschisis

<table>
<thead>
<tr>
<th></th>
<th>Omphalocele</th>
<th>Gastroschisis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without anomaly (78%)</td>
<td>Without anomaly (73.8%)</td>
<td></td>
</tr>
<tr>
<td>Clubfoot (22%)</td>
<td>Heart murmur (9.5%)</td>
<td></td>
</tr>
<tr>
<td>Cyanotic heart disease (2.4%)</td>
<td>Respiratory distress (7.1%)</td>
<td></td>
</tr>
<tr>
<td>Macroglossia (2.4%)</td>
<td>Gastric rupture (2.4%)</td>
<td></td>
</tr>
<tr>
<td>Toe deformity (2.4%)</td>
<td>Intestinal atresia (2.4%)</td>
<td></td>
</tr>
<tr>
<td>Peripheral cyanosis (2.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypospadiasis (2.4%)</td>
<td></td>
<td></td>
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<tr>
<td>Thoracic mass (2.4%)</td>
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</table>

### DISCUSSION

In our study, incidence of omphalocele and gastroschisis was 20.88 and 6.52 /10,000 live newborn respectively. In our study, associated anomalies were detected in 21.8% of cases with omphalocele and 10% of cases with gastroschisis.

Stoll et al, studied 86 cases with omphalocele and 86 cases with gastroschisis. They found associated anomalies in 74.4% of cases with omphalocele and 16.6% of gastroschisis. However, in two studies rate of associated anomalies were higher in omphalocele, but the rate of anomalies in Stoll et al. study was much higher than our study (6). In other study by Stoll et al, on 265,858 consecutive births, mean prevalence rate for omphalocele was 2.18/10,000 and for gastroschisis was 1.76/10,000 (6). However this difference may be due to failure in registration of associated anomalies in chart of patients.

In a study by Tan et al., incidence of gastroschisis and omphalocele were 0.63/10000 live birth and 2.17/10000 live birth respectively (7). In the current study, incidence of gastroschisis and omphalocele was 6.52 and 20.8 /10000 live birth respectively.

In Williams et al. study, between 1968-1998, incidence of gastroschisis was reported 0.78-4.64 (8). In Rankin et al., study, from 1986-1996, incidence of gastroschisis was reported from 1.48-5.29 (9).

In the study by Golalipour et al, on 10,000 birth (live and still birth) in Gorgan at north of Iran, omphalocele was detected in 2 case (10). In our study, we found 24 cases with omphalocele in live born. However, still born cases were not included in our study, it seems that rate of omphalocele was significantly higher in our province than Gorgan (9).
In another study by Golalipour et al, on 37951 live newborn from 1 January 1998 till 31 December 2003, omphalocele and gastroschisis were found in 7 (1.84/10,000 live birth) and 4 (1.05/10,000 live birth) respectively (11). In our study, rate of both condition was higher than Golalipour et al. study.

As shown above, incidence of gastroschisis and omphalocele was more common than previous study. Although, it is possible that environmental exposure play a role in the development of gastroschisis (12, 13, 14).

In our previous study, we compared anomalies in two period. First period was 1993-1996 and the second was 2002-2005. In the first period, 88 cases were included and in the 2nd period 452 cases were included. In the 1st period of study omphalocele was detected in 6.8% of cases with anomalies and in the 2nd period was present in 4.9% of cases. Gastoschisis was present in 2.72% of cases with anomalies and 1.54% of cases with anomalies in the 2nd period. In the 1st and 2nd periods of study, mortality rate of gastoschisis was 100% and 85.7% respectively. Mortality rate of omphalocele was 66.7% and 22.7% in the 1st and 2nd period of study (15). In the current study, period of study was 2005-2007. Results showed that there is no difference between mortality rate in the 2nd period (2002-2005) of previous study and the current study (2005-2007). However there is overlap between two study.

In other study gestational age was 38 (32-40) and mean age was 2900 g with range of 1000 to 3100 g (16). In our study gestational age was 37 was (32-40) and mean age was 2971 g (1470-4000 g). Findings of two study were similar.

In our study, we found no correlation between age of mother and frequency of omphalocele or gastroschisis. In study done by Materna-Kiruluk et al, there was no significant correlation between parental age and omphalocele. Risk of gastoschisis is inversely related to both maternal and parental age (17).

In our study, there was 35% mortality in cases underwent surgery. In Alavrez and Burd study (18), mortality rate among gastoschisis cases was 3.5% and was less than our study. This higher mortality may be due to less equipments available in our hospital compared to US hospital.

In our study, rate of abdominal wall defect was higher than other studies conducted in US. Previous studies, showed that younger maternal age had association with abdominal wall defect. In Iran, especially in Khuzestan, pregnant women is generally younger than women in Western countries.

Although, Khuzestan had suffered from 8 year war and also other wars that occurred in Iraq, neighbor of Kuzestan province. Effect of released chemical material during war may be the cause of this high prevalence of abdominal wall defect.

Environmental exposure may play a role in the development of gastoschisis (13). Khuzestan had many oil and petrochemical company. This high number of chemical company may be another possible factor that associated with high rate of abdominal wall defect.

CONCLUSIONS

In our hospital, rate of gastoschisis and omphalocele was higher than other country. Mortality rate among cases with gastoschisis was significantly higher than cases with omphalocele. Due to high rate of abdominal wall defect in our study, we recommend careful observation of pregnant mother and early detection of this anomalies.

REFERENCES


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